IN THE SPECIFICATION:

Please replace the following paragraphs of the specification as filed:

[0037] From the origin of the isoparametric co-ordinate systems for quadrilateral elements, the new location of node i as shown in Figure 1 can be expressed as

$$Pi' = \frac{1}{N(2 - [[w]]\ \underline{r})} \sum_{n=1}^{N} Wn\,(Pn_j + Pn_l - rPn_k) \qquad (2)$$

where the variational weighting factor and the positional function for each element can be expressed as

$$Fn = \frac{Wn}{N(2 - r)}; \quad \Omega n = (Pn_j + Pn_l - rPn_k) \qquad (2a)$$

and N is the number of elements connected to node I, i-j-k-l represents an average connected quad, r is the coupling factor between Laplacian and isoparametric methods, Pnj, Pnk, Pnl, represent the position vectors of the j-th, k-th and l-th nodes of the [[n-the]] <u>n-th</u> connected quad respectively, Pi' represents the new location of the node to smooth, and Wn represents weight factors for each connecting element n such that

$$\sum_{n=0}^{N} Wn = 1.0;$$

[0039] Note that when r = 0, equation ~~(1)~~ (2) reduces to Laplace smoothing. When r = 1.0, a pure isoparametric grid is produced with quad elements showing very low skewness, but the nodal lines of the mesh become zig-zag. Experience with scheme has proven that r = 0.5 results in good quality meshes with an overall skewness that is almost invariably better than the Laplacian variants.

[0048] The governing equation for equipotential (Winslow) smoothing can written for node i as

$$\alpha Pi_{\xi\xi} - 2\beta Pi_{\xi\eta} + \gamma Pi_{\eta\eta} = 0; \qquad (4)$$

where [[x,h]] ξ,η are logical variables that are harmonic in nature, while ~~a, b, g~~ α, β, γ are constant coefficients that depend on the problem.

[0053] where σ is the smoothing operator, $\sigma (P_i)$ indicates[[,]] node i is smoothed, N denotes number of elements connected to node I, θmax, θmin are the element allowable angular limits, and α_{ji} denotes the included angle of element ~~element~~ j at node i.

[0054] Constrained Movement: Since this smoother is most beneficial to users who are trying to modify existing meshes, add features and build geometry from them, many users would prefer ~~the~~ to move nodes in a constrained manner. For example, they may not want their mesh nodes to move off their current location by more than a certain amount. Once the user specifies such a node movement tolerance dTol, the nodes are moved from their present location such that they always reside within the sphere of radius R = dTol as shown in Figures 7A and 7B.

[0065] Ability to preserve mapped-meshes: Most smoothing algorithms do not recognize mapped/structured grids. The angle smoother employs a Winslow smoothing algorithm ~~[12]~~ for nodes that are connected to 4 quadrilaterals or 8 triangles. The benefits of the variational smoother are illustrated in Figures 9A-9C. Figure 9A shows a 4X6 mapped mesh on a concave region.